



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

45

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/803,329

03/18/2004

Anna N. Yaroslavsky

910000-2043.1

5580

71284

7590

10/11/2007

EDWARDS ANGELL PALMER & DODGE LLP

P.O. BOX 55874

BOSTON, MA 02205

EXAMINER

KISH, JAMES M

ART UNIT

PAPER NUMBER

3737

MAIL DATE

DELIVERY MODE

10/11/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/803,329

Applicant(s)

YAROSLAVSKY ET AL.

Examiner

James Kish

Art Unit

3737

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 18-34 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 18-34 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>12/21/06, 4/18/07</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 18, 20-23, 25-26 and 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alfano et al.'394 (US Patent No. 5,847,394) in view of Alfano et al.'886 (US Patent No. 6,208,886). Alfano et al.'394 herein is referred to as [394] and Alfano et al.'886 is herein referred to as [886].

[394] discloses a method and apparatus for imaging objects based upon the polarization of light. Preferably, the pulse of illuminating light is polarized. Where, for example, the pulse of illuminating light is linearly polarized, the pair of complementary polarization components are preferably the parallel and perpendicular components to the polarized illuminating light, and the image may be formed by subtracting the perpendicular from the parallel component. See column 7, lines 25-30 for specific wavelengths used for the invention. Also, the present invention is also based, in part, on the discovery that one can image a turbid medium at various depths thereof by illuminating the turbid medium with light pulses of different wavelengths (column 4, lines 15-53). However, [394] does not disclose utilizing different wavelengths to create a composite image. [886] teaches an apparatus utilizing non-linear optical signals for use in constructing a three-dimensional tomographic map of an in vivo biological tissue for

Art Unit: 3737

medical disease detections purposes (see Abstract). [886] teaches that images of tissues obtained by different excitation wavelengths can be used to produce 2D or 3D difference and/or ratio image maps (column 10, lines 46-61). Also, see Figure 12. It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the discovery that one can image a turbid medium at various depths using different wavelengths ([394]: column 4, lines 15-53) to produce 3D difference and/or ratio image maps ([886]: column 10, lines 46-61) to determine the states of tissue: cancer, pre-cancer, benign and normal ([886]: column 10, lines 46-61).

With respect to the specific wavelengths used in the claimed invention, [886] teaches several wavelengths that would be utilized in the method at Table 1. It would be obvious to one of skill in the art to vary the wavelength to any value to obtain the proper depth and/or fluorophor emission.

Claims 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alfano et al.'394 in view of Alfano et al.'886, and further in view of Alfano et al.'983 (US Patent No. 6,091,983). Alfano et al.'983 is herein referred to as [983].

[394] in combination with [886] is described previously in the rejection of claims 18. However, neither of these references utilize a contrast agent. [983] teaches a method and system for imaging an object in a turbid medium, but adds a contrast agent to the object to make it luminescent. It would have been obvious to one having ordinary skill in the art at the time the invention was made to add a contrast agent to the area

under examination in order to prevent an object of interest from hiding within the turbid medium (column 3, lines 26-32).

Claims 19, 27 and 29-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alfano et al.'394 in view of Alfano et al.'886, and further in view of either Eckhouse et al. (US Patent No. 5,836,999) or Khalil et al. (US Patent No. 6,615,061). [394] in combination with [886] is described previously in the rejection of claims 18. However, neither of these references discuss a depth estimation. Khalil teaches that the penetration depth is the reciprocal of the effective attenuation coefficient. In assuming that no light will be absorbed per unit path length, the equation reduces to:

$$\text{Depth} = 1 / (\mu_s(1-g))$$

This equation, which is actually the reciprocal of the reduced scattering coefficient, is well-known in the art and it would be obvious to one having ordinary skill in the art to utilize it to estimate a depth traversed by light through a turbid medium.

In Eckhouse, see column 5, lines 40-55.

In Khalil, see column 8, line 56 through column 9, line 7.

Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Alfano et al.'394 in view of Alfano et al.'886, further in view of either Eckhouse et al. (US Patent No. 5,836,999) or Khalil et al. (US Patent No. 6,615,061), and further in view of Alfano et al.'983. [394] with [886] and either Eckhouse or Khalil is described previously in the

rejection of claims 19, 27 and 29-31. However, none of these references utilize a contrast agent. [983] teaches a method and system for imaging an object in a turbid medium, but adds a contrast agent to the object to make it luminescent. It would have been obvious to one having ordinary skill in the art at the time the invention was made to add a contrast agent to the area under examination in order to prevent an object of interest from hiding within the turbid medium (column 3, lines 26-32).

### ***Conclusion***

Also see Utzinger et al. (US Patent No. 6,766,184. Especially column 11, line 64 through column 12, line 6.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 3737


the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James Kish whose telephone number is 571-272-5554. The examiner can normally be reached on 8:30 - 5:00 ~ Mon. - Fri..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571-272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JMK

  
BRIAN L. CASLER  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3737